

PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Before the Board of Patent Appeals and Interferences

In re application of Juergen **DICKMANN** et al.

Confirmation No.: **8976**

Appln. No.: **10/779,454**

Art Unit: **3634**

Filed: **February 13, 2004**

Examiner: **STRIMBU Gregory J.**

For: **DOOR AREA MONITORING DEVICE FOR MONITORING THE SWING
AREA OF AN AUTOMOBILE DOOR**

Attorney Docket No.: **3926-063**

Customer No.: **41288**

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AMENDED APPEAL BRIEF

Sir :

In response to the Notification of Non-Compliant Appeal brief dated June 19, 2008,
Appellants submit herewith the Amended Appeal Brief.

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Real Party in Interest:

This application is assigned to Daimler AG of Stuttgart, Germany. The assignment has been recorded by the USPTO on June 5, 2008, at Reel No. 021053, Frame No. 0466.

Related Appeals and Interferences:

No related appeals or interference proceedings are currently pending which would directly affect or be directly affected by or have a bearing on the Board's decision in this appeal.

Status of Claims:

Claims 1 and 4-18 are rejected and are under appeal. Claims 2-3 were cancelled in the response dated August 17, 2007.

Status of Amendments:

The Examiner stated in an *Advisory Action* dated August 29, 2007 that the Amendment filed August 17, 2007 failed to place the application in condition for allowance and the proposed amendments filed after the Final Rejection would not be entered. Accordingly, no claim amendments were entered after the final Office action. A *Notice of Appeal* was filed on October 3, 2007.

Summary of the Claimed Subject Matter:

Independent claim 1 of the instant application recites a door space monitoring device for monitoring a door swing area of a vehicle door (see paragraph [0001], lines 1-2 of the specification), comprising:

sensor means (1) for sensing a presence of an object in the door swing area of the vehicle door (see, e.g., paragraph [00026], line 1 of the specification and Fig. 1),

a sensor-data evaluating evaluation unit (provided on the circuit board (6), no reference number; Fig. 2 shows in detail how the sensor-data is evaluated) (see, e.g., paragraph [00027], line 19 of the specification), and

a control unit (provided on the circuit board (6), no reference number) for controlling the sensor means (1) (see, e.g., paragraph [00027], lines 5-6),

wherein a monitoring area sensed by the sensor means (1) is substantially two-dimensional (see, e.g., paragraph [00031], line 2 of the specification), and wherein the sensor

means (1) includes at least one light source (3) for emission of a light beam, at least one micro-mirror-unit (4) for pivoting the light beam (3) and at least one photo-detector (5) for monitoring the two-dimensional monitoring area (see, e.g., paragraph [00026], lines 1-4 of the specification and Fig. 1);

wherein the micro-mirror-unit (4) has at least one micro-mechanical pivotable planar mirror associated with an additional non-planar mirror (see, e.g., paragraph [00010], lines 1-4 of the specification);

wherein the additional non-planar mirror is shaped such that its contour corresponds to the contour of the vehicle door (see, e.g., paragraph [00010], lines 14-16 of the specification).

Independent claim 6 of the instant application recites, in combination with a vehicle door, a door space monitoring device for monitoring a door swing area of the vehicle door (see paragraph [0001], lines 1-2 of the specification) comprising:

sensor means (1) for sensing a presence of an object in the door swing area of the vehicle door (see, e.g., paragraph [00026], line 1 of the specification and Fig. 1),

a sensor-data evaluating evaluation unit (provided on the circuit board (6), no reference number; Fig. 2 shows in detail how the sensor-data is evaluated) (see, e.g., paragraph [00027], line 19 of the specification and Fig. 2), and

a control unit (provided on the circuit board (6), no reference number) for controlling the sensor means (see, e.g., paragraphs [00027], lines 5-6),

wherein a monitoring area sensed by the sensor means is substantially two-dimensional (see, e.g., paragraph [00031], line 2 of the specification), and wherein the sensor means includes at least one light source (3) for emission of a light beam, at least one micro-mirror-unit (4) for pivoting the light beam and at least one photo-detector (5) for monitoring the two-dimensional monitoring area (see, e.g., paragraph [00026], lines 1-4 of the specification and Fig. 1);

wherein the light source (3), the micro-mirror-unit (4) and the photo-detector (5) are provided in an area of a pivot axis of the vehicle door (see, e.g., paragraph [00013], lines 1-3 of the specification).

Grounds of Rejection to be Reviewed on Appeal

1. Whether or not claims 5, 13-14 and 17-18 are definite under 35 U.S.C. § 112, second paragraph.
2. Whether or not claims 1 and 10 are anticipated by Japanese Patent Publication No. 10-26724 (hereinafter JP 10-26724) under 35 U.S.C. § 102(b).
3. Whether or not claim 4 is patentable over JP 10-26724 and further in view of Hornbeck (US 5,650,881) under 35 U.S.C. § 103(a).
4. Whether or not claims 5-6 and 15 are patentable over JP 10-26724 and further in view of Mochida et al. (US 4,458,446) (hereinafter Mochida) under 35 U.S.C. § 103(a).
5. Whether or not claims 7-8 are patentable over JP 10-26724 and further in view of Haas et al. (US 4,782,224) (hereinafter Hass) under 35 U.S.C. § 103(a).
6. Whether or not claim 9 is patentable over JP 10-26724 and further in view of Underwood (US 4,118,625) under 35 U.S.C. § 103(a).
7. Whether or not claims 11-14 are patentable over JP 10-26724 in view of Hornbeck and further in view of Isogai et al. (US 2003/0090647) (hereinafter Isogai) under 35 U.S.C. § 103(a).
8. Whether or not claims 16-18 are patentable over JP 10-26724 and further in view of Isogai under 35 U.S.C. § 103(a).

Argument:

**CLAIMS 5, 13-14 AND 17-18 ARE
DEFINITE UNDER 35 U.S.C. 112, SECOND PARAGRAPH**

Claims 5, 13-14, and 17-18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite.

The claims have been amended to overcome the rejections in the amendment submitted on August 17, 2007 in response to the final Office action. Since the amendment has been entered and the Examiner did not indicate any further rejection under 35 USC 112, second paragraph, in the Advisory action, it is assumed that the rejections have been overcome.

**CLAIMS 1 AND 10 ARE PATENTABLE
OVER JP 10-26724 UNDER 35 U.S.C. 102(B)**

Claims 1 and 10 are rejected under 35 U.S.C. 102(b) as being anticipated by JP 10-26724.

The present invention concerns a door space monitoring device that monitors a door swing area of a vehicle door and thus is part of the vehicle and has close relationship with the vehicle door. According to claim 1, the micro-mirror-unit has at least one pivotable planar mirror associated with an additional non-planar mirror and thus realizes the two-dimensional monitoring area in which a light beam is pivoted as a reflected beam by the pivotable planar mirror and this reflected beam then encounters the additional non-planar mirror, which due to its non-planar design realizes a two-dimensional monitoring area that corresponds to the contour of the vehicle door. The surface of the non-planar mirror corresponds to the contour of the vehicle door and thus a very simple and reliable two-dimensional monitoring area of the vehicle door is achieved. See, e.g., paragraph [00010] of the specification.

JP 10-26724 discloses a multi-point distance measuring system, which has a micro-mirror-unit (DMD 16) (see especially Fig. 1 with description). The distance to a detected object or its extension can be obtained in connection with a consideration of multiple points of the object taking into consideration of a travel time. This multi-point distance measuring system is applied exclusively in connection with a camera (see paragraph [0014] of the disclosure). It is described there that the system is connected with a photo optical system 20 (see Fig. 1), which is part of a camera. Based on the measured distances to different points of a detected object, the camera is adjusted sharply accordingly. Further hint toward the exclusiveness of the application with camera/photograph can be found in paragraphs [0008] and [0012].

Nowhere does JP 10-26724 mention or suggest a reference to a vehicle or door space monitoring device for a vehicle. The mere possibility of determining the distance of an object to multiple points and thus implicitly detecting the presence of the object for a camera with such a multi-point distance measuring system does not provide any hint to integrate this camera multi-point measuring system in a door monitoring device. This system is specifically designed for the application for cameras due to the ability of determining the distance for multiple measuring points at the same time. The technical requirements of temperature stability and mechanical robustness especially vibration rigidity for a camera system are totally different from those for an automobile system for monitoring the vehicle door space. Therefore, it is not obvious to transfer such a camera system to a vehicle door space monitoring device.

Although JP 10-26724 discloses the application of two DMD-chips, each of which has a plurality of individual planar mirrors corresponding to the first micro-mechanical pivotable planar mirror of the present invention, it does not disclose the second additional non-planar mirror.

Clearly, JP 10-26724 only discloses the application of a multi-point distance measuring system for a camera. This reference does not provide any hint toward a door space monitoring system according to the present invention, especially not concerning the problem of such a system, which is especially marked by a robustness, compactness, and especially vibration resistance. With the door space monitoring system according to the present invention, it is not necessary to determine a distance to a detected object, especially not multi-point distance to the a detected object, but rather it is only necessary to determine the presence of the object. It is, therefore, clear that JP 10-26724 does not provide any hint toward realizing a door space monitoring system.

In addition, JP 10-26724 does not provide any hint toward a combination or replacement of a sensor for another known door space monitoring system. Therefore, JP 10-26724 can also not be combined with another known door space monitoring system.

Since the features of original claims 2-3 have now been incorporated into claim 1 and claims 2-3 were rejected by a combination of JP 10-26724 and Hornbeck, a discussion of Hornbeck is necessary.

Hornbeck discloses a special formation of a micro-mirror-unit, which is also identified as DMD-unit. This special formation concerns the location and rotation of the individual micro-mechanical mirrors of the plurality of small micro-mechanical mirrors, which together form the micro-mirror-unit. Hornbeck does not provide any hint to substitute such a micro-mirror-unit. Especially, there is no hint of applying it as a component of a sensor for a door space monitoring device. The existence and the basic functionality of a micro-mirror-unit is explained in the background of the specification and is assumed to be in principle known. However, Hornbeck does not contain any hint toward the application of the micro-mirror-unit in the direction of the present invention and does not provide any advantage or problem in the direction of the present invention. A combination of Hornbeck with another reference is, therefore, not obvious.

Hornbeck only very generally discloses that the individual mirrors of a DMD-array can have concave and/or convex and/or planar surfaces and does not provide a hint anywhere that the surface should correspond to the contour of the vehicle door. Especially, Hornbeck,

just as JP 10-26724, does not disclose anywhere any reference to an automobile, especially not a reference to a vehicle door or a door space monitoring device for a vehicle door.

It is, therefore, clear that a combination of JP 10-26724 and Hornbeck also does not disclose or suggest the specific mirror arrangement for a door space monitoring device with the specific design of a single additional non-planar mirror. Claim 1 is, therefore, believed to be patentable over JP 10-26724 in view of Hornbeck and since claim 10 is dependent on claim 1, it is believed to be patentable as well.

**CLAIMS 5-6 AND 15 ARE PATENTABLE OVER
JP 10-26724 IN VIEW OF MOCHIDA UNDER 35 U.S.C. 103(A)**

Claims 5, 6, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 10-26724 and further in view of Mochida.

The feature of claim 6, namely the micro-mirror-unit and the photo-detector are provided in an area of a pivot axis of the vehicle door, is not disclosed by JP 10-26724 or Mochida.

Mochida discloses an ultrasound-based remote control system for a door, in which the ultrasound sensor and the ultrasound receiver are arranged at the front region of the fender on the fender in the mirror "k" (see Figs. 5A & C) or in the handle "a" of the front door and the back door of the vehicle. The front region of the fender or the handle of respective door is not in the region of the pivot axis of the vehicle door, rather is far from the region of the pivot axis of the vehicle door. Especially, the door opening mechanism must be far way from the pivot axis of the door so that it is possible for a simple opening and closing of the door without overly large expenditure of force. Also, the mirror "k" with the ultrasound sensor and ultrasound receiver at the front region of the front fender is deliberately arranged far away in order to realize a large three-dimensional monitoring region "B" with large angle, thus to possibly safely encompass the opening region of the vehicle door. This can only be achieved by a position at the front end of the vehicle and thus far away from the pivot axis of the vehicle door.

In contrast, the present invention does not use any ultrasound sensor and forms a monitoring area in the manner of a curtain, namely a two-dimensional monitoring area, due to which no distance measuring is required. The present invention further differs from Mochida et al. in that it enables a very compact arrangement under the application of a micro-mirror-unit for pivoting the light source to form a curtain-like monitoring area (two-dimensional) and that the sensor unit is provided in the area of the pivot axis of the vehicle door. This

enables a very simple and effective monitoring with help of a curtain-like two-dimensional monitoring area. This is preferred so formed that the distance of the monitoring plane to the door expands with the increasing distance from the pivot axis. These aspects are not disclosed by Mochida.

It is, therefore, clear that the sensors according Mochida, on the one hand, have a completely different sensor principle (ultrasound vs. optical sensors) from that of the present invention, thus applying to clearly different monitoring regions (three-dimensional monitoring region with relative large club opening vs. two-dimensional monitoring region) and, on the other hand, have different positions of the sensor units (far away vs. in the area of the pivot axis of the vehicle door), which lead to completely different effects.

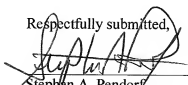
It is, therefore, clear that claim 6 is not disclosed or suggested by JP 10-26724 or Mochida, or a combination thereof. Mochida shows a system for remote control and monitoring of a vehicle door, which concerns a totally different concept from the present invention. Mochida does not contain any hint to apply a different sensor concept other than ultrasound concept, especially not such a specific optical monitoring concept with DMD-devices according to the present invention.

Claim 6 is, therefore, believed to be patentable over JP 10-26724 in view of Mochida. Claims 5 and 15 are believed to be patentable because they are dependent on claim 1.

The patentability of dependent claims 4, 7-9, 11-14, 16-28 have not been separately argued. Claims 4, 7-9, 11-14, 16-18 are believed to be patentable because they are dependent on claim 1.

The Commissioner is hereby authorized to charge any fees which may be required at any time during the prosecution of this application without specific authorization, or credit any overpayment, to Deposit Account Number 16-0877.

Respectfully submitted,


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Date: July 21, 2008

Appendix – Claims

1. A door space monitoring device for monitoring a door swing area of a vehicle door, comprising:
 - sensor means for sensing a presence of an object in the door swing area of the vehicle door,
 - a sensor-data evaluating evaluation unit, and
 - a control unit for controlling the sensor means,wherein a monitoring area sensed by the sensor means is substantially two-dimensional, and wherein the sensor means includes at least one light source for emission of a light beam, at least one micro-mirror-unit for pivoting the light beam and at least one photo-detector for monitoring the two-dimensional monitoring area.
2. The door space monitoring device according to Claim 1, wherein the micro-mirror-unit has at least one micro-mechanical pivotable planar mirror is associated with an additional non-planar mirror.
3. The door space monitoring device according to Claim 2, wherein the additional non-planar mirror is shaped such that its contour corresponds to the contour of the vehicle door.
4. The door space monitoring device according to Claim 2, wherein the additional non-planar mirror is mounted to be pivotable and is micro-mechanically driven.
5. The door space monitoring device according to Claim 1 in combination with the vehicle door, wherein the light source, the micro-mirror-unit and the photo-detector are provided
 - on an external mirror which is attached to the vehicle door, in an external mirror which is attached to the vehicle door,
 - on a vehicle door handle, or in a vehicle door handle.

6. The door space monitoring device according to Claim 1, in combination with a vehicle door, wherein the light source, the micro-mirror-unit and the photo-detector are provided in an area of a pivot axis of the vehicle door.
7. The door space monitoring device according to Claim 1, wherein the light source, the micro-mirror-unit and the photo-detector are provided in a common housing.
8. The door space monitoring device according to Claim 7, wherein within the housing, the micro-mirror-unit is provided between the light source and the photo-detector, and that off-set to the side thereto, at least one of the control unit and the evaluation unit is provided upon a common circuit board.
9. The door space monitoring device according to Claim 1, wherein the at least one photo-detector is a PIN-diode.
10. The door space monitoring device according to Claim 1, wherein light output of the light source controlled by the control unit is adjusted according to the degree of pivoting of at least one micro-mechanical mirror of the micro-mirror-unit.
11. The door space monitoring device according to Claim 2, wherein during a pivot process, pivoting of the at least one micro-mechanical planar mirror of the micro-mirror-unit is controlled by the control unit to pivot at regular intervals over a predetermined pivot range to produce the light beam passing through the two-dimensional monitoring area.
12. The door space monitoring device according to Claim 11, wherein the pivoting over the predetermined pivot range occurs within a time span of less than 5 ms.
13. The door space monitoring device according to Claim 12, wherein between two pivot processes a time span of greater than 25 ms and preferably less than 50 ms occurs.
14. The door space monitoring device according to Claim 12, wherein the control unit is so designed, that the light source and preferably also the photo-detector are activated

essentially only during the pivot process, preferably only during each n-th pivot process with n being less than 10.

15. The door space monitoring device according to Claim 1 in combination with the vehicle door, wherein the light source, the micro-mirror-unit and the photo-detector are so arranged, that the distance of the two dimensional monitoring area from the vehicle door essentially also increases with increasing distance of the two dimensional monitoring area from the pivot axis of the vehicle door.
16. The door space monitoring device according to Claim 1, wherein the light source, the micro-mirror-unit and the photo-detector are provided in a common housing together with the evaluation unit for distance measurement by a phase delay process.
17. The door space monitoring device according to Claim 16, wherein the evaluation unit is adapted to carry out on the basis of reference values, preferably a lookup table stored in a memory, corresponding to a shape or design of the vehicle door, an evaluation of a potential detected obstacle to determine if the obstacle will damage the door.
18. The door space monitoring device according to Claim 1, wherein dependent upon the detection of an obstacle in the door swing area:
 - a warning signal is emitted,
 - a further automatic opening of the vehicle door is interrupted, or
 - a further opening of the vehicle door is actively prevented.